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PROBLEMS OF CLASSIFICATION AND YARD MODERNIZATION OF HUNGARIAN RAILROADS

Robert Ertl

Several decades ago, the more important Hungarian classification terminals changed from flat to hump switching. Some of the classification yards abroad likewise are built on the gravity method, although they deviate in some respects from the Hungarian system. Since the cars roll down an incline by their own momentum, tractive power is dispensed with.

This paper describes the most important type of hump terminal, the main parts of which are the following:

1. Receiving yard for incoming freight trains.

2. Hump, where the cars are separated.

3. Hold tracks for receiving the freight cars after separation.

4. Classification tracks for reassembling the freight cars according to stations of destination.

5. Tracks for making up trains.

The efficiency of the hump terminal, as well as security of operations, may be increased by the employment of car retarders. The running time can be equalized by retarding the freight cars in good running condition. If brakes are applied, the cars will follow one another at a faster rate.

The simplest method is the use of brakeshoes. At the end of the retarding-track section a mechanism is built into the roadbed, which releases the brake-shoes. By the use of brakeshoes, the cars can follow one another at intervals of 8 seconds. At a shunting speed of one meter per second, 50 cars can be rolled downhill in less than 6 minutes 40 seconds. If the same operation were performed without braking, the time required would be doubled.

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Actually, however, braking does not give optimum results. The mechanism built along the tracks does not measure the speed of the cars correctly and cannot select the proper length of track on which a car must be braked. If a car in poor running condition is followed by several cars in good running condition, the brakeshoes cannot be applied to the cars properly, even if several brakeshoes and releasing mechanisms are employed. Also, the switches cannot be set safely. As a result, accidents and concomitant loss of time will be unavoidable if a high speed is maintained. For these reasons, even trained personnel cannot maintain a speed in excess of 12 seconds between cars, which is equivalent to 10 minutes for a 50-car train. If the personnel is untrained, the required time will increase to 12-14 minutes per train.

While employment of brakeshoes is the most simple solution, it is the least satisfactory. Both the brakeshoes and the cars are exposed to heavy knocks, the releasing mechanisms and the rails in the braking section require increased maintenance, and the mechanisms must be replaced frequently. In short, the employment of brakeshoes will give only partial results.

The French railroads are experimenting with a perfected method. The various solutions which they have found are based on the employment of a third rail. The brakeshoe is not equipped with a projecting rim on the interior, but connects with the third rail by means of a special extension. The return of the brakeshoes to their original position is regulated either by a motor or by springs. However, no completely satisfactory solution of this method has been developed yet.

A much better retarding method employs railbrakes, which retard the car by squeezing blocks against the inner rims of the wheels. The blocks are operated hydraulically by remote control. Retarding may be discontinued instantly. It is customary to build two, or even four, retarders into the receiving siding. Their main purpose is to regulate the intervals between cars, while speed regulation is of secondary importance. It is advisable to build two groups of brakes, that is, to have each car pass through two groups of retarders. The first group regulates the intervals between the cars and the second controls the speed of the cars. Multiple braking results in excellent control of car movement.

Rapid movement of the cars, at intervals of 5-8 seconds, requires frequent switching. The switches must be controlled by one operator, and the motors are operated centrally from a table which shows the pattern of the tracks. Mechanically, the switches can be set at any desired speed; however, the limitations of human attention and reaction reduce the number of operations to five per minute. Abroad, this limitation led to the employment of automatic switches. Experience has shown that the two groups of switches nearest the crest of the hump account for 70 percent of switching. For this reason, it was sufficient to mechanize these two groups, that is, seven or eight switches only. The remaining switches may be operated by the central switchman.

Automatic switches are of various types. Usually, the mechanism is set in advance according to the sequence of the cars. The automatic switches are operated by the cars themselves. The cars pass through an isolated section, called the effect field, and set the switches for the following car. Operation of the automatic switches requires less than 4 seconds.

As will be seen from the foregoing, modern equipment is a prerequisite for the efficient operation of the hump terminal. Modern equipment includes centrally operated retarders, mechanized control of the switches, automatic switches, loudspeakers, two-way radios, searchlights, and, possibly, pneumatic message tubes.

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A hump freight yard without modern equipment can move at best 2,000 cars per day. However, the number of cars will be much smaller if the personnel is untrained or if the location of the terminal is unsuitable. The capacity of a modern hump freight yard is approximately 4,000 cars per day. If the entire installation is up to date, and the personnel is well trained, an even greater number of cars can be moved.

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